

WHAT IS CLAIMED IS:

1 1. A method of producing fine-line circuitry on a printed
2 circuit board having a planar surface and at least one filled
3 plated through hole, said method comprising the steps of:
4 (a) drilling at least one hole through a dielectric
5 substrate, said hole defining a surface;
6 (b) depositing a seed layer on planar surface of said
7 dielectric substrate and on said surface defined by said hole;
8 (c) depositing electrically conductive plating on said
9 planar surface of said dielectric substrate and on said surface
10 defined by said hole to form a subcomposite;
11 (d) filling said hole with a filler composition;
12 (e) etching said subcomposite to partially remove said
13 electrically conductive layer to thereby reduce the
14 thickness of said electrically conductive layer;
15 (f) removing residual amounts of said filler composition on
16 said subcomposite;
17 (g) etching said subcomposite to completely remove said
18 electrically conductive layer;
19 (h) depositing a seed activator on the surface of said
20 subcomposite;
21 (i) covering said subcomposite with a photoresist and
22 exposing and developing said photoresist to reveal selected areas
23 of said subcomposite; and
24 (j) additively plating electrical circuitry on said
25 selected areas of said subcomposite.

1 2. The method of claim 1 wherein said dielectric
2 subcomposite is an epoxy.

1 3. The method of claim 1 wherein said etching of said
2 electrically conductive layer in step (e) reduces the thickness
3 to a minimum thickness of about 0.2 mil.

1 4. The method of claim 1 wherein said additive plating
2 onto said subcomposite produces circuit lines, the thickness and
3 width of said lines being approximately equal.

1 5. The method of claim 1 wherein the width of the lines of
2 said circuitry deposited on said filled plated through hole is
3 about equal to or less than the diameter of said filled plated
4 through hole.

1 6. The method of claim 1 wherein the method further
2 comprises attaching a component having a pad to said conductive
3 plating deposited on said filled plated through hole, the
4 diameter of said pad being approximately the same size or smaller
5 than said plated through hole.

1 7. The method of claim 1 further comprising, providing a
2 photosensitive dielectric layer on said subcomposite, and forming
3 circuit lines on said photosensitive dielectric material, and
4 forming vias through said photosensitive dielectric such that
5 said circuit lines communicate with said fine-line circuitry of
6 said subcomposite.

1 8. A method of producing fine-line circuitry on a printed
2 circuit board having filled plated through holes, said method
3 comprising the steps of:

4 (a) drilling at least one hole through a dielectric
5 substrate, said hole defining a surface;
6 (b) depositing electrically conductive plating on planar
7 surface of said dielectric substrate and on said surface defined
8 by said hole to form a subcomposite;
9 (c) filling said hole with a filler composition, said
10 composition having nubs protruding beyond said planar surface of
11 said subcomposite;
12 (d) removing said nubs of said fill composition such that
13 said planar surface of said subcomposite is nearly smooth;
14 (e) etching said subcomposite to partially reduce the
15 thickness of said electrically conductive metal layer;
16 (f) scrubbing said nubs of fill composition protruding from
17 said subcomposite;
18 (g) etching said subcomposite to completely remove said
19 electrically conductive metal layer of said subcomposite;
20 (h) depositing a seed activator on said subcomposite;
21 (i) covering said subcomposite with a coating and exposing
22 and developing said coating to reveal selected areas of the said
23 subcomposite;
24 (j) depositing conductive plating on said exposed areas of
25 subcomposite to form fine-line circuitry; and
26 (k) stripping said photoresist.

1 9. A printed wiring board comprising a dielectric
2 substrate, at least one filled plated through hole, and circuitry
3 on said dielectric substrate connecting to said plated through
4 hole, said circuitry having a line width approximately equal to
5 or less than the diameter of said filled plated through hole.

1 10. A printed wiring board comprising a dielectric
2 substrate, at least one filled plated through hole, and circuitry

3 on said dielectric substrate connecting to said plated through
4 hole, said circuitry having an aspect ratio greater than about
5 0.5.

1 11. A printed wiring board comprising a dielectric
2 substrate, at least one filled plated through hole, and circuitry
3 on said dielectric substrate connecting to said plated through
4 hole, said circuitry having an aspect ratio greater than about 1.